

05/06/2009

IN THE CLAIMS

Claims 1-20 (Canceled).

Claim 21 (Currently Amended): A method of producing an α crystal structure-based alumina film, comprising:

an initial first step of forming an undercoat of the alumina film having an α crystal structure under conditions suited for formation of α crystal structure alumina by sputtering of an aluminum metal target in an oxidizing gas-containing atmosphere; and

a subsequent second step of continuing to form the film on the undercoat by changing the film forming conditions whereby an α crystal structure alumina continues to be formed on the undercoat.

Claim 22 (Previously Presented): A production method as set forth in Claim 21, wherein the film forming conditions in said second step are changed to higher rate film forming conditions.

Claim 23 (Previously Presented): A production method as set forth in Claim 21, wherein the film forming conditions in said second step are changed to lower temperature conditions.

Claim 24 (Previously Presented): A production method as set forth in Claim 22, wherein the film formation in said first step is carried out in a poisoning mode discharge condition and the discharge condition in said second step is changed to a transition mode or a metal mode.

Claim 25 (Previously Presented): A production method as set forth in Claim 22, wherein the film formation in the first step is carried out at a film formation rate not exceeding 1 nm/min and the second step is carried out at a film formation rate of not lower than 3 nm/min.

Claim 26 (Previously Presented): A production method as set forth in Claim 21, wherein the film formation in the first step of film formation is carried out at a substrate temperature not lower than 800°C and then a substrate temperature is lowered to 650-750°C for the second step.

Claim 27 (Previously Presented): A production method as set forth in Claim 21, wherein said second step is performed under conditions under which films with high hardness can be formed.

Claim 28 (Previously Presented): A production method as set forth in Claim 21, wherein said second step is performed by increasing the absolute value of a negative bias voltage.

Claim 29 (Previously Presented): A production method as set forth in Claim 21, wherein the first step is carried out while a negative bias voltage not higher than 100 V in absolute value is applied to the substrates and the second step is carried out while a negative bias voltage of 200 V or more is applied to the substrates.

Claims 30-40 (Cancelled).